North Carolina Highway Bulletin

VOL. IV MAY, 1923 NO. 3

SCENE ON PROJECT NO. 532—GUILFORD COUNTY—ROUTE 10

TONCAN Metal Culvert 48 in. diameter, 200 feet long, being installed for the City of Suffolk, Va. Of special interest to engineers, because 100 feet were manufactured to lay in a curved line conforming to a radius of 60 ft.

TONCAN Metal Culvert under Bankhead Highway near Maud, Texas. Many carloads of TONCAN METAL Culverts have been used in drainage of this national highway and its approaches.

There is a good road above this culvert

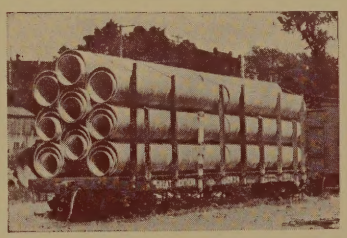
—it will stay good, too

TONCAN METAL
CORRUGATED CULVERTS

are absolutely proof against breakage; adapted to every culvert service. Handled, transported and installed at very low cost. The heavily galvanized TONCAN METAL assures long, satisfactory service. Made in diameters from 8 in. to 72 in.

Culverts are but one use for TONCAN METAL. There are hundreds more. In fact, wherever rust and corrosion resisting metal is desirable, TONCAN METAL gives maximum satisfaction.

All of the "BERLOY" Products mentioned below can be supplied by us, made of TONCAN METAL.



1,056 feet of TONCAN METAL Culverts loaded on one car. Note how smaller diameters are shipped inside the larger.

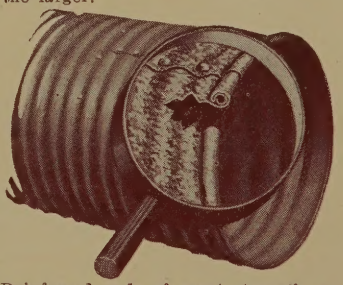
ROAD MACHINERY

You can depend upon us for prompt service when needing Equipment for Road Building. At Roanoke we carry a complete stock of the following:

"Panama" Road Graders and Road Drags: "Western" Wheelers, Drag Scrapers and Plows.

BERLOY
SHEET METAL PRODUCTS

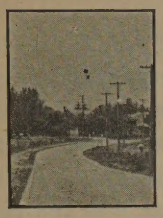
These include Metal Lath, Metal Lumber, Floor Cores, Metal Roofing and Siding, Trough and Pipe, Ridge Roll, Valley, Metal Shingles, Metal Ceilings, Metal Lockers and Steel Shelving, Filing Equipment. We can also supply Toncan Metal and Steel Sheets.



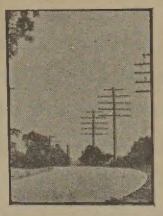
Reinforced ends of great strength, as above shown, supplied with culverts 24 in. diameter and smaller, when so ordered.

THE DOMINION METAL PRODUCTS CORPORATION

ROANOKE, VIRGINIA



NORTH CAROLINA HIGHWAY BULLETIN



VOL. IV, NO. 3 H. K. WITHERSPOON, Editor MAY, 1923

Review *of* Four Years *of* Highway Construction *in* State

CONSTRUCTION work in progress and completed when highway work was really begun in North Carolina amounted to very little indeed compared to the amount in the same status on the first of this month. Four years ago the name of North Carolina was scarcely ever connected with good roads or road construction, whereas today the two terms are synonymous. The State, by reason of the large program which is under way, has risen to a stand in the front ranks of the States engaged in extensive road programs and has gained an enviable reputation as being one of the most progressive States in the Union. This is reflected not only in highway construction but in those things that inevitably come with good roads. There is a general air of prosperity throughout the State; the class of houses being built in the rural districts are of a much better class than have previously been built. Another significant indication of the progress of North Carolina is the increase in the manufacture of cotton goods. North Carolina leads the entire South in the amount of capital invested in cotton manufacture, having $268,322,984 invested with prospects of the amount being largely increased with the removal of a number of cotton mills from Massachusetts to this State. In addition to leading the South in this important industry the State ranks second in the United States. This progress indirectly goes back to the prosperity brought about by the system of good roads that have been completed and are now being built in the State.

Going back four years to the beginning of highway work in the State, on May 1st, 1919, there was under construction and had been completed in the State under the direction of the State Highway Commission 17 projects, totalling 111.05 miles and costing in round figures $822,500. Construction during this period could not be carried on to any great extent except by the coöperation of the counties, as the amount of State funds available was limited and all of the work was carried on with funds provided by the counties and from Federal Aid, the usual proportion being one-fourth from the State, one-fourth from the county in which the work was located, and one-half from Federal Aid funds. In the case of the few hard-surfaced projects, cost was divided equally between the county and the Federal Government.

Following the passage of the Doughton-Connor-Bowie Act in 1921, the organization of the Commission was changed in certain instances and the force increased to take care of the program made possible by the appropriation of $50,000,000. Plans were made for the awarding of a large mileage of road work and these were successfully carried out, resulting in a steady increase in the mileage under contract and construction. The slogan adopted during the early part of the past year was "1,000 Miles In 1922," and somewhat in excess of this mileage was actually put under contract.

Plans were made for the awarding of approximately 800 miles of roadwork during 1923, and to date 300.71 miles have been placed under contract, and in many instances the work is already under construction. Because of labor and material conditions the further awarding of contracts in large amounts will probably be held up.

Construction figures as of May 1st, 1923, show a great increase over those given above as of May 1st, 1919. On the first of this month there were either under contract, construction or completed a total of 428 projects. To go more into detail, there were under contract on this date, 16 projects totalling 137.71 miles and estimated to cost $2,992,376.53. Construction work is in progress on 223 projects having an aggregate of 1,849.15 miles and an estimated cost of $35,320,986.26. Work had been completed on 189 projects, the total mileage of which is 1,186.32, miles of the various types and which cost in round figures $17,787,713. A grand total of all work under contract, construction, and completed is as follows: Total number of projects, 428; total mileage of roadway, 3,182.18; total estimated cost of roadway, $53,847,459.15; total estimated cost of bridge projects, $2,253,616.69; total estimated cost of all work (roads and bridges), $56,101,075.84.

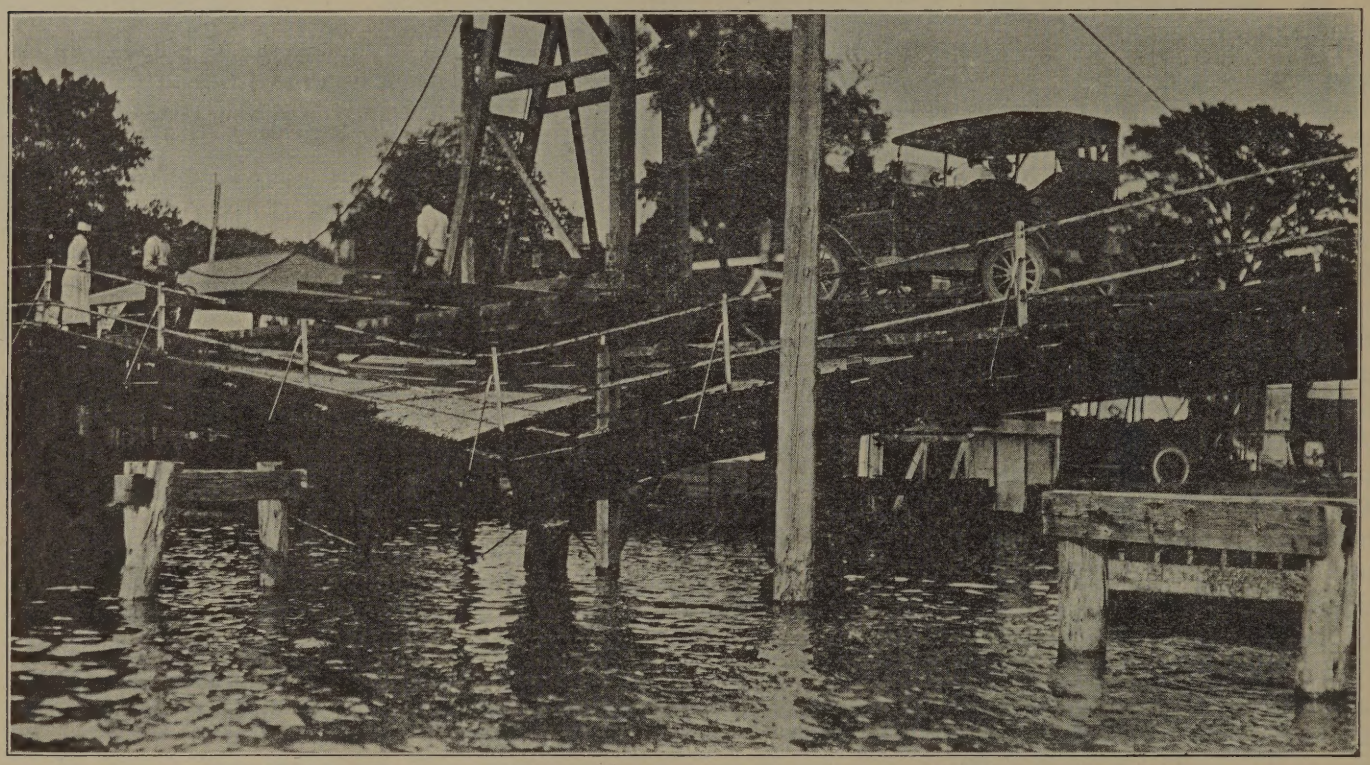
(*Continued on Page 20*)

Old Bridge *at* Washington Fails

THE photograph above shows the span of the bridge over the Tar River at Washington which collapsed recently under the weight of a large crowd of people who had assembled to witness a display of fireworks that were being set off from two barges anchored a short distance up the river. The fact that the hand-railing did not give way was all that prevented a very serious accident in which scores of people would have been drowned.

It was erroneously reported that the bridge was built by the State Highway Commission, while as a matter of fact it was built some twenty-five or more years ago, by whom records fail to disclose, and since that time has had very little attention. At the time of the accident the bridge maintenance forces of the Commission had just completed the work of placing additional members to strengthen the floor system and had put down a new floor of creosoted timber and a wearing course of asphalt. Forces were engaged in giving the steel work of the bridge a coat of paint.

The bridge consists of a draw-span 145 feet long and 37 thirty-foot spans, the total length being approximately 1,255 feet. The bridge is largely of steel construction with I-beam stringers and a wooden floor. Other than the draw span, the bridge is supported by hollow steel columns about 18 inches in diameter which are filled with concrete. These are in turn supported on wooden piles driven into the bed of the river. The column which gave way, as shown in the photograph, was supported by four piles, two of which buckled and broke under the unusual load and allowed the bridge to settle. The settling was gradual and the creaking gave sufficient warning to prevent anyone from falling into the river. The new floor which had just been laid and the fact that the pipe railing did not break undoubtedly prevented more serious accident. The most seriously inconvenienced persons were those spectators who had cars parked clear across the bridge and who were forced to leave them on the bridge all night.



SCENE OF ACCIDENT AT WASHINGTON

To the floating bridge gang of the State Highway Commission belongs credit for opening the bridge to traffic before eleven o'clock the following morning. A temporary crossing was provided and carried a steady stream of traffic throughout the day. A pile driver belonging to the Commission was brought ten miles from another job and a force put to work erecting same. When the Editor visited the scene on the afternoon following the accident, work of erection had been practically completed and it was expected that driving would start on the following morning. It was planned to drive piles under the bridge upon which it could be jacked up to grade and additional piles driven upon which the steel column would be fixed. With these repairs the bridge will be in good condition and capable of bearing ordinary loads.

Authorized Large Bridge Projects

By P. K. Schuyler, *Assistant Engineer,* North Carolina State Highway Commission

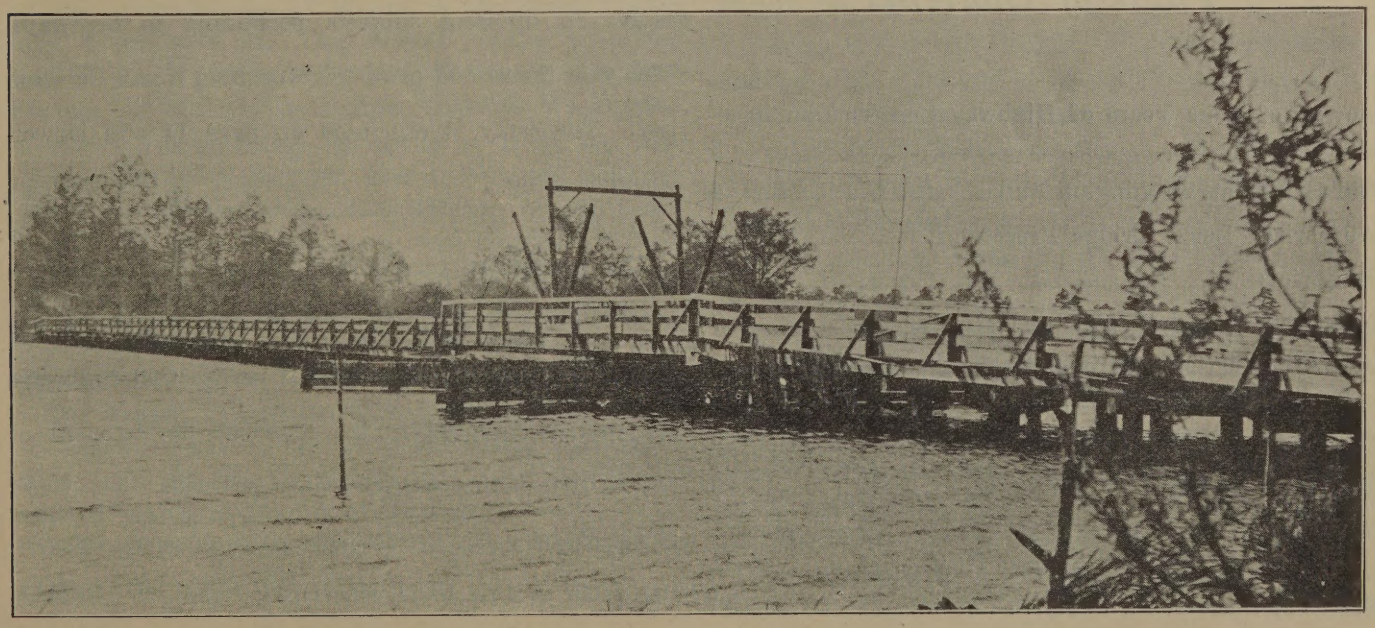
BESIDES the work now under construction there are under survey, or contemplated, four major bridge projects, each of which will cost over $140,000. The surveys for the bridges are being made by the Structure Survey Department under the Bridge Engineer. In this way it is possible to obtain the exact information needed in the design of these structures. Extensive borings are being made at each proposed site, such work being let to contract to well drillers in the State. After numerous experiments and investigations it has been found that the most satisfactory and economical way of obtaining foundation data is by the use of a well drill. Rock can readily be drilled by this outfit and the thickness of the strata determined.

Project 302, Bladen County, across the Cape Fear River, will be the largest bridge of those proposed. The main structure will be 2,294 feet long, supplemented by two small overflow bridges. The river span of this bridge will be a steel Petit Truss 350 feet clear span and 50 feet above mean low water. This clearance is required by the War Department so as not to be an obstacle to navigation. An antique ferry is now operated at this point, but at times of high water is put out of commission. The first highway bridge from the mouth now across the Cape Fear River is at Fayetteville. The plans for this work are nearly completed and the estimated cost is approximately $350,000.

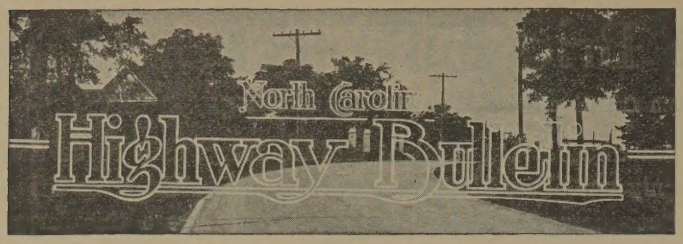
Project 610, Anson-Richmond counties, will be a bridge across the Pee Dee River on the road from Rockingham to Wadesboro. This bridge will consist of about eleven 150-foot arch spans, total length, 1,650 feet. An unusual but efficient electric ferry, said to be the only one of its kind, now operates across the river here, but during the recent high water of March this ferry was shut down for over a week, and at one period during the month the new Swift Island Bridge near Albemarle was the only point between Winston-Salem to below Cheraw, S. C., where an automobile could cross the river. This project is now being surveyed and the approximate cost will be $275,000.

Project 148, Gates-Hertford, across the Chowan River at Winton, will be a structure about 785 feet long, consisting of a precast concrete pile trestle with a 155-foot steel swing span. The present ferry operated by the State is entirely inadequate to take care of the heavy travel on this route in the summer, and at times 30 cars are lined up waiting to cross. This will be the only bridge in North Carolina over this river, which is wide and deep, being 30 feet deep for the full width at the proposed site. The approximate cost of this structure, which is now being surveyed, will be $165,000.

Project 365, Onslow County, is a bridge across the New River at Jacksonville on the Coastal Highway, that is authorized. The existing bridge is a pile trestle which was built about 1870, right after the Civil War. The original bridge was destroyed during the war to prevent the advance of Northern Troops. The present trestle is of peculiar design having a swing span made up of gin poles, as shown in the photograph. The contemplated structure at this point is a precast concrete pile trestle with a hundred-foot swing span, the cost to be about $140,000.



Old Bridge Over New River at Jacksonville



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Address all communications in regard to BULLETIN to the Editor, Box 1140, Raleigh, N. C.

This BULLETIN will be sent gratis to any State or county official, contractor, newspaper, trade publication, library, or other person interested in the improvement of roads and in the work of the Commission. Advertising rates may be obtained on application.

Volume IV **MAY 1923** **Number 3**

Table of Contents

Editorial

The life of a "travelling man" is not "a bed of roses"; neither is that of a "highwayman," and it is a pleasure to receive such communications as the one printed elsewhere in this issue and to know that the work of the Commission is appreciated

The double-page cut in this issue shows some handsome roads in the Fifth District, but it is typical of work being done all over the State. There are at present approximately 1,961 miles of roadwork, under contract and construction, of which 954 miles are of the hard-surface type and the work is evenly distributed over the State.

The next large letting will be held on June 27, when bids will be received on the projects listed on the opposite page, and probably others which had not been decided upon at this time.

The young people of the State are its future citizens and it is proper that their interest in road-building should be fostered. Each year prizes are given for essays on different subjects pertaining to highways. This year the second prize was won by a North Carolina boy. The essay is reprinted on page 11 and is well worth reading.

The question of road-building is one of vital importance to every State in the Union; and, while some are ahead of others in the work, all realize that highways are just as essential to the economic development of any section of the country as are railroads. The Chief of the Bureau of Public Roads gives out some interesting facts in this issue concerning "the job ahead in road-building."

Next Letting *to be* Held June 27th.

TWENTY-FOUR projects aggregating 155.88 miles of road are tentatively scheduled for letting on June 27. Of this mileage bids will be asked on hard-surfacing on 64.16 miles; on topsoil or sand-clay on 75.62 miles; grading only on 16.1; in addition there is one large bridge and one overgrade crossing. The list following is subject to change. In the First District bids will be asked on Project 141, Halifax-Edgecombe counties, consisting of 20.1 miles on route No. 12, from Whitakers to the Halifax County line. Bids will be asked on topsoil, sand-clay, or gravel.

Project 146, Hertford-Bertie counties, 6.42 miles on route No. 305, from the Northampton County line to Aulander. Bids will be asked on types as above.

Project 168, Northampton County consists of 17.7 miles on route No. 305 from Jackson to the Hertford County line via Rich Square. This is also a topsoil or sand-clay job.

Project 189, Pitt County, consists of 6.0 miles from the Greene County line on route No. 91 to Farmville, thence to the Greene County line on route No. 12. Bids will be asked on hard-surfacing.

In the Second District bids will be asked on three projects, all of which are to be hard-surfaced. Project 213, Craven County, consists of 10.43 miles on route No. 10, between Fort Barnwell and New Bern. This is to be hard-surfaced and when completed will close up the opening in a paved road extending from New Bern to Goldsboro.

Project 230, Greene County, extends from the Wilson County line to the Pitt County line, a distance of 4.8 miles. Bids will be asked for hard-surfacing.

Project 293, Wilson County, extends from the end of the pavement east of Wilson to the Green County line on route No. 91. This project together with Project 230 and a portion of Project 189 complete the hard-surface link of route No. 91 from Wilson to Washington.

The fifth large bridge project to be let by the Commission will be Project 302, Bladen County. This project covers the construction of a bridge at Elizabethtown. The main bridge has a total length of 2,293½ feet and will be of concrete except for the steel span of 350 feet across the river proper. In addition the project includes one 365-foot bridge across an arm of the Cape Fear River, and one span of 50 feet.

The Fourth District has three projects to be let, one of which, however, has been previously advertised. This is Project 408, Durham County, consisting of 0.47 mile of paving in the city of Durham.

Project 438, Harnett County, consists of 4.0 miles of paving from Duke to Dunn.

Project 464, Person County, consists of 12.0 miles of road on route No. 57, from Roxboro to the Granville County line and will be let for grading and topsoil or sand-clay surfacing.

Bids will be asked on four projects located in the Fifth District. Project 506, Alamance County, consists of the paving at each end of the Haw River bridge in the town of the same name.

Project 507, Alamance County, consists of 4.0 miles of road on route No. 62 from Graham to Belmont. Bids will be asked for penetration macadam.

Project 541, Guilford County, consists of 4.0 miles of road between Greensboro and Liberty on route No. 60. Bids will be asked on penetration macadam.

Project 556, Montgomery County, extends from the northern limits of Mt. Gilead 7.0 miles south on route No. 51 to the Richmond County line. Plans call for the first 3.0 miles to be surfaced with penetration macadam and the remainder with topsoil.

Only one project is advertised from the Sixth District, this being Project 672, Rowan County, which extends from the Iredell County line 3.7 miles toward Salisbury on route No. 10. Bids will be asked for hard-surfacing this road.

In the Seventh District bids will be received on two projects. The first of these, Project 702-B, Alleghany County, extends from Sparta for a distance of 7.4 miles toward Jefferson on route No. 69. This is to be a topsoil or gravel road.

Project 750-B, Stokes County, is a continuation of Project 750-A, and extends from Big Creek to Danbury on route No. 89 a distance of 8.0 miles. Bids for topsoil or gravel surfacing will be received.

Four projects will be advertised for bids from the Eighth District.

Project 802, Avery County, is located between Newland and Elk Park and is 3.5 miles long. Bids will be asked on macadam surfacing.

Project 811-B, Burke County, is an overpass at Glen Alpine on Project 811, which is now under construction.

Project 812, also in Burke County, consists of grading 6.0 miles on route No. 10 from Glen Alpine to Bridgewater.

Project 836, Henderson County, extends from Henderson to the Buncombe County line on route No. 29.

In the Ninth District bids will be asked on two projects, both of which have been previously advertised. Project 930-A, Graham County, consists of the macadam surfacing on 2.92 miles of route No. 108 near Robbinsville.

Project 961-A, Macon County, consisting of the macadam surfacing on Project 961, which is located between Franklin and the Swain County line on route No. 286.

An Appreciation

ONE of the results of an improved road system is the rapidly increasing number of commercial travelers who travel by automobile rather than by train. To verify this statement one has only to go out on any of the principal highways in the State and the greater majority of the cars that pass and are passed will be those driven by the above mentioned fraternity. For this reason they are in better posittion perhaps to judge the conditions of the various roads and to note the progress of the work that is being carried on in the way of marking the roads and other improvements tending to make the highway routes more easily distinguished. During the recent annual Convention at Rocky Mount the following resolution was passed and a copy forwarded to this office:

RESOLVED: That, we the Officers and Delegates of the North Carolina Division T. P. A. in Annual Convention assembled at Rocky Mount, N. C., May 10-11-12, recognizing the progress in all lines in our State and especially the work of the State Highway Commission, desire to call to the attention of our people the good work of the State Highway Commission in placing sign posts marking the routes and distance to principal points, as well as the detours and the fine shape in which said detours are kept, wish to go on record and thank said State Highway Comimssion for their good work in making it possible to travel from the Tennessee line to the Coast by simply following the well marked routes.

D. C. CRUTCHFIELD,
Sec'y N. C. Div., T. P. A.

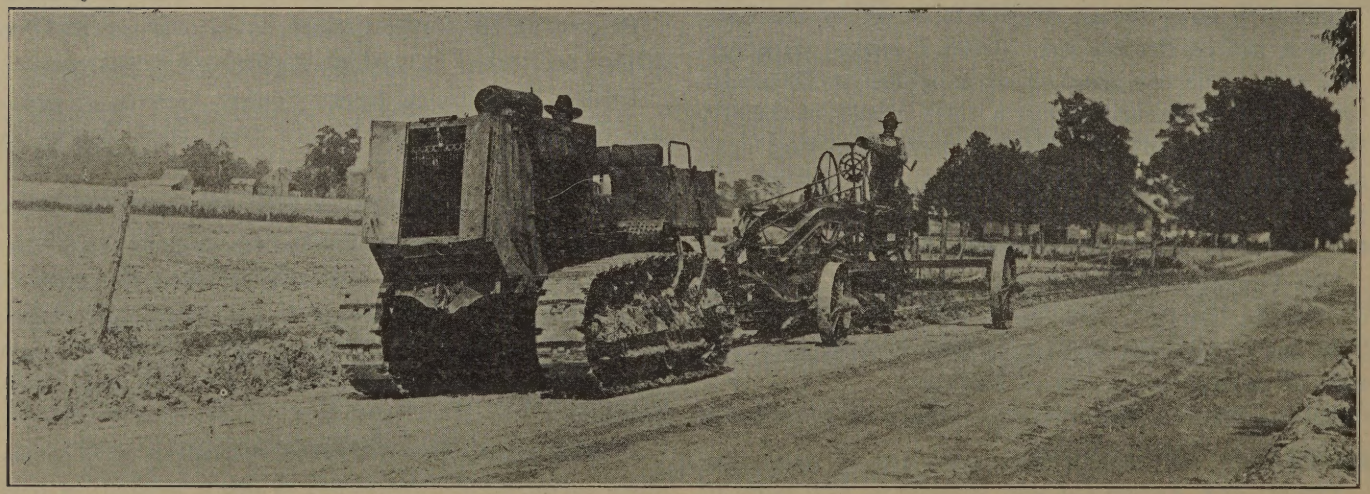
Trainload *of* Cement 13 Miles Long

A TRAIN made up of 1,557 cars, or one 13.2 miles long, would be an unusual sight, to say the least. The cement ordered by the State Highway Commission during the first four months of 1923 amounted to 269,305 barrels and the prospects are that the demand during the summer months will be much larger. An average car of cement contains 173 barrels, or 692 bags, hence a solid train of 1,557 cars would be required to haul this cement from the mill to its destination. An even larger amount of crushed stone and sand is required to combine with the cement for use in road and bridge building in the State. These figures give an idea of the immense amount of materials required for carrying on the State Highway program.

There are at the present time 724 miles of road under contract or construction which require cement either in the base course or for the wearing course. On practically all of the graded and earth roads cement is required for the culverts and structures and there are several large bridge projects which require quantities of cement.

New Map Published

THE State Highway Commission through the Publicity Department, has recently issued a revised edition of the official highway map and the demand for these maps indicates the immense amount of traffic that is using the State Highway System. The maps are published in a convenient size to fold and fit the pocket or to place under a desk top. On the front side is shown the State Highway System with different types of road indicated and the route number shown in red while on the reverse side is printed a table giving the distance from every county seat to every other county seat in the State by following the shortest State Highway route. These maps may be obtained by addressing the Editor and enclosing a two-cent stamp to cover cost of mailing.



MAINTAINING NORTH CAROLINA ROADS WITH SURPLUS WAR MATERIAL

Conference *of* Highway Officials

Harrisburg, Pa., March 24, 1923.

To His Excellency, Governor Pinchot:

As a result of the deliberations of the Highway Conference, the Committee on Conclusions submits the following:

Administration

The construction, maintenance, financing and operation of highways is becoming more and more a question of nation-wide transportation and less one of neighborhood convenience. There are two general phases to every problem coming before a State highway department for solution—the business and the technical. A majority of the States have recognized this fact by providing for either engineer commissioners or technically trained engineer executives. We believe this principle is sound fundamentally and urge the State authorities, both executive and legislative, to provide at all times strong engineering control in the administrative and executive work of their State highway departments and engineering supervision of the construction, maintenance and operation of the highway systems.

To this end we urge that these departments be removed from political influences, and that continuity of service be preserved for a sufficient period to insure stabilized policies. In no other way is it possible to safeguard and protect the interests of the citizen, who is paying for the roads.

State highway departments, with their knowledge of the geography and topography of the States, should determine without legislative or other interference what roads or systems of roads should be constructed and maintained with State funds and should not be governed by legislation as to types and cost of construction.

Finance

Every State highway department should be operated under an Annual Budget System.

The cost of building and maintaining adequate systems of highways should be distributed equitably among the sources of highway revenue in proportion to the benefits derived from the improvement.

The permanent features of original construction of highways should be financed on the "pay as you go" plan or from the proceeds of serial bonds, according to the stage of development of the highway systems now existing in the several States.

The policy of requiring the user of the roads to pay for the service received through a license and a gasoline tax is a sound one, and all revenues from such sources should be applied primarily to the maintenance and reconstruction of highways.

Construction

Owing to variations in climate, soil, traffic conditions and available materials, no one standard type of pavement is practical for the country or even for a State.

Granite block, brick and bituminous tops on a concrete foundation, and a concrete pavement may be termed as construction of the first class; the so-called flexible types of pavements may be termed as construction of the second class; and gravel, sand and clay or other topsoil roads may be termed as construction of the third class.

The progressive method of construction, whereby the grading, structures and drainage are first completed and the hard-surface pavement laid later, is both a practical and at times, the most advantageous method of highway construction.

Maintenance

Unless adequate maintenance is provided for, initial construction of highways should not be undertaken at all.

The same engineer who builds the road should be held responsible for its up-keep.

Traffic

Each State highway department should establish a traffic bureau to make a highway transport survey in all its phases, to determine present and forecast future, traffic conditions, to assist in the selection of the economic road construction.

Efforts should be made, in co-operation with motor vehicle officials, to establish as soon as possible uniform motor vehicle laws and regulations, so that the user of the road may travel under uniform laws wherever he goes.

It is highly desirable that a uniform law be enacted by the States of the Union regulating the dimensions of motor-driven vehicles and the wheel load of such vehicles.

An effort should be made to provide proper standard devices for the protection of the road user and the prevention of accidents and no person should be allowed to operate a motor-driven vehicle upon a public highway until such driver has been examined and a license showing competency has been granted.

We believe in the installation of simple, easily followed direction signs.

A more determined effort should be made to promptly eliminate all grade crossings.

(*Continued on Page 20*)

The Job Ahead *in* Road Building

FACTS and figures made public at the annual meeting of the American Road Builders' Association by Thomas H. MacDonald, chief of the U. S. Bureau of Public Roads, should remove any misgivings regarding the need for a large scale national road-building program continued over a number of years. Few people have any real conception of the task ahead in highway development. At present the yearly outlay by the federal government, States, counties and townships bulks large when considered by itself. Viewed in the light of the ultimate job of providing the United States with adequate highway transport facilities, however, the yearly budgets of today, running close to a billion dollars for rural highways—and this figure excludes paving work within city limits—shrink to modest proportions.

The nation's total rural highway mileage is about 2,800,000, of which approximately 180,000 miles have been included in the 7 per cent Federal Aid system specified in the Highway Act of 1921. Citing the fact that since 1916 about 25,000 miles of the Federal Aid highway system had been completed, Mr. MacDonald seems to have ample justification for his statement that "we haven't even started to build highways in this country." Coming from the highest ranking road official in the country this estimate of the situation is significant, and it becomes doubly so when reinforced by results of a new and comprehensive statistical survey of expenditures for rural highways throughout the country, completed recently by the Bureau of Public Roads, showing a total for all purposes, outside of cities, of $970,000,000 during the year 1921. Previous incomplete estimates placed this figure at a considerably lower level—about $600,000,000. The later and more accurate information, therefore, shows that the previous yearly estimates which were considered in some quarters as extravagant were, in reality, conservative. If the nation is ever to catch up with the demands of its highway traffic an expansion, rather than a contraction, of the road-building program must occur. And, as the new construction is completed year by year, the mileage that must be maintained also will grow, a situation which led Mr. MacDonald to say: "I do not see any end to the road-building program."

Some objectors to the large expenditures being made on the Federal Aid system labor under the mistake of assuming that the construction is all of the costly heavy-traffic type. As a matter of fact, the Bureau's figures show that only 26.8 per cent of the Federal Aid construction thus far completed comes within the foregoing classification, and effective answer to the charge that the new system discriminates against the local road user. The further fact is brought out that in a State like Indiana, for example, 99 per cent of the total population is included in belts 5 miles wide on each side of the Federal Aid system.

The question today is not whether we need the roads but whether we can get them built. In roads, as in practically all other forms of construction, we are far behind our needs, but we must face the fact that our construction capacity, either in men or materials, is grievously below our needs. It will be necessary, therefore, to apply to our road program the same restraint as is being applied to other construction. The criterion for any proposed road must be the relative ease of getting the men and the material without disrupting the market in either. Fortunately, as the above figures show, the larger part of our proposed roads are local enterprises, imposing no great load on transportation systems, material producers or the national supply of labor. Such road-building must go on, subject only to the restrictive elements in the local labor and material situation. As for the heavy traffic trunk roads, necessity is the major criterion, just as it is in buildings. The thing to remember is that all figures are relative and that a billion dollars a year is not too much to spend in this year of increased production capacity, when the country readily absorbed nearly that much in low-production year of 1921.

One more point needs emphasis: Less than one-half of the billion-dollar-a-year program is being spent under the control of Federal and State agencies. It is clear, therefore, that one of the most pressing problems is the development of local organizations with business and technical personnel qualified to direct the economical expenditure of large sums and to design and construct roads adequate for the needs they are intended to serve.

What Good Roads Have Done *for the* Schools *and* Citizens *of* Currituck County, N. C.

By Alton D. Taylor, *Freshman*, Currituck High School

(Second Prize)

THE road past my door is an excellent highway, but as this road has not always been good, I can more easily appreciate it as it now stands.

In 1917 the people of Crawford Township, Currituck County, North Carolina, realizing the importance of education, consolidated and built a High School at Currituck, our county seat. After this was done, there was still a three and a half-mile walk over a bad and muddy road for some of the pupils, and I was one of those living at a distance.

The school thrived, and, with the whole-hearted coöperation of the teachers, got practically one-fifth of the population of the county interested in our work; but our plays and entertainments were attended only with great difficulty by the people, because of the unimproved condition of the roads.

In 1918, the Board of County Commissioners, prompted by the great work in education that was going on at our High School, and by influential citizens who realized what a handicap the unimproved roads were, voted for an issue of $80,000 in bonds to drain, grade, and properly culvert our roads. This was done with much success, as our sandy land has a subsoil of a clay nature, and after the roads were plowed deep, graded, and drained with culverts and ditches, we had beautiful and serviceable sand-clay roads, which we could now never do without.

I live in what is geographically termed the coastal plain of the United States, and there are numerous swamps throughout the region. With a system of ditches and tile drainage to these bogs, we never have any water standing on the roads. (Right here let me say that drainage is the prime factor in building roads in this section.) The greatest problem developed where the road passed over these bogs. The way this problem was solved was by elevating the road with a mixture of sand-clay hauled from the near-by high land.

This work was done by an expert supervisor. He used two army trucks for hauling and plowing, a grading machine and a heavy road-drag or leveler.

In 1921 when our State began road improvement, our county showed so much progress and improvement in road construction work that its highways were held up as an illustration of what good roads should be, to all State road officials. Recently a famous Italian statesman came to North Carolina for the purpose of studying road construction methods which he intends to use upon his return to Italy. The State is giving us about 65 miles of hard-surfaced roads, leaving our County Highway Commission about 100 miles to care for.

Our county is a peninsula jutting into Albemarle Sound, and we have numerous islands connected with the mainland by marshes. In the future we will carry to completion the roads to these islands. One has just been completed at a cost of $15,000 for 8 miles of roads. Expensive, it is true, but worth it, considering an island of 2,000 inhabitants with no thoroughfare to the city! Another such project is in progress at a cost of $6,500 for three miles of road, shown in an accompanying photograph.

Mr. Joseph P. Knapp, New York multi-millionaire and world-wide sportsman, made a visit to our county in 1920, and became so impressed with the thrift and versatility of our citizens and the great progress in our road and school work, that he purchased Mackey's Island for a winter home of his own, and gave his citizenship to Currituck County. The transition of this island to a beautiful park and country home is a story in itself. This island is connected with the mainland by an improved road of pipe clay. Being thoroughly drained with proper culvert installations, it is always hard, making a perfect highway.

Mr. Knapp, after seeing what we had done to help ourselves in the way of good roads and schools, donated to our county $100,000 for still further development of our schools and roads, and also to beautify our county seat, including the completion of a monument to our Confederate dead.

In conclusion, dear reader, whoever you may be, I wish to say Currituck citizens have worked hard for their school and road progress, but we have much to gain. Mr. Knapp referred to this, saying he was more willing to help those who were trying to help themselves. Luke 19, 26th verse: "That unto every one which hath shall be given; and from him that hath not, even that which he hath, shall be taken away."

The High School boys and girls are our greatest factor in promoting school and road improvement. This is a strong statement, but I can prove it from observation and experience. That would be another story, however.

As I have stated before, due to the geographical situation of our county, we have to expend large sums of money on a few miles of road. Many counties do not have these difficulties, and I do not see that there is any need for their having mud roads any more. If the grandfathers of the people in these counties could arise from the tomb they would be greeted with everything new save the old rough, rugged, unimproved roadway past their doors.

"Carolina, Carolina, heaven's blessing attend her,
While we live we will cherish, protect and defend her."

STATUS OF STATE WORK IN NORTH CAROLINA

Projects Under Construction

NO.	COUNTY	LENGTH	TYPE	ESTIMATED COST	BEGUN	CONTRACTOR
101	Beaufort	4.23	P. C.	$ 145,492.76	1-20-23	Public Service Production Co.
105A	Beaufort	2.00	P. C.	78,839.42	11-11-22	J. L. McGhee Cont. Co.
105B	Beaufort	5.037	P. C.	164,301.61	1-19-23	Public Service Production Co.
106	Bertie	7.12	T. S.	58,204.90	9-11-22	J. F. Mulligan Const. Co.–Boney & Hostetler.
110	Camden	2.71	R. C.	134,866.48	7-11-22	State Forces
113	Chowan	10.32	Graded	39,743 33	2—1-22	Nello L. Teer—Gregory & Talbot.
113B	Chowan	9.89	S. A.	100,000.00	4-9-23	State Forces.
129	Edgecombe	8.1	Graded	40,850.00	9-14-22	State Forces
131	Gates	15.95	T. S.	135,515.60	8-22-22	Bacon & Moore—W. D. Murray—Sadler Corp.
132	Gates	10.90	T. S.	63,921.00	8-29-22	J. A. Marrow.
133	Gates-Pasquotank	14.07	Gravel	138,045.77	11—7-22	C. W. Lacy—Pittsburg Des Moines Steel Co.
137	Halifax	5.95	Bit Mac & P. C.	180,441.92	11-21-21	O. F. Leighton—A. C. House.
138A	Halifax-Northampton	12.59	S. C.	131,712.13	5—1-22	Nello Teer—Richards Bros.
138B	Northampton-Halifax	.....	Bridge	347,188.74	2-28-23	Pensacola Shipbuilding Co
145	Hertford	12.88	Graded	88,161.42	7-31-22	Jameson & Bro.—Atlantic Bridge Co.
147	Hertford-Bertie	17.36	Graded	122,245.86	3—5-23	Nello Teer—Atlantic Bridge Co.
151	Hyde	4.30	T. S.	71,422.28	12-10-21	C. W. Lacy—Porter & Peck.
152	Hyde	10.89	S. C.	75,651.40	1-15-23	O. A. Mann & Co.
154	Martin	11.27	A. C.	394,153.29	4-17-22	Sou. Willite Paving Co.—O. F. Leighton, Inc.
155	Martin-Pitt	20.01	T. S.	98,176.65	1—9-22	J. P. Dicus—J. M. Gregory.
155B	Martin	19.3	P. C.	493,900.40		W. T. Hadlow.
157A	Martin	12.50	T. S.	85,813.86	10-18-22	Jamison & Bro.—J. A. Marrow.
157B	Martin	12.50	T. S.	90,396.24	11-13-22	J. F. Mulligan Constr. Co.—Batson Cook Co.
159	Nash	11.22	T. S.	89,942.43	1—2-22	J. A. Kreis & Co.
167	Northampton	20.48	T. S.	92,444.11	7-17-22	Virginia Contr. Co.—Bacon & Moore.
173	Perquimans-Pasquotank	7.22	R. C.	239,444.70	8-25-22	Williams & Williams.
174	Pasquotank-Camden	2.40	Cord	55,818.01	4—3-22	D. E. Williams.
175	Pasquotank	9.50	Brick	217,405.72	4—6-21	County Commissioners.
183A	Pitt	13.54	P. C.	399,854.40	11-13-22	S. J. Groves & Sons.
183B	Pitt	.....	Bridge	32,343.30	3-27-22	B. J. Boyles.
184	Pitt	7.14	P. C.	206,516.42	11-21-22	Public Service Production Co.
185	Pitt	14.35	Graded	31,069.72	3-29-22	J. A. Marrow.
191	Tyrrell	6.91	S. C.	58,594.41	1-20-22	C. W. Lacy—M. M. Jones.
195	Washington	15.18	S. C.	65,619.35	2-28-22	L. M. Lee & Co.—B. J. Boyles.
196	Washington	14.93	S. C.	83,632.78	5-15-22	W. N. Thompson.
200	Carteret	13.68	Graded	79,629.00	7-21-22	Eagle Eng. Co.—Batson-Cooke Co.
201	Carteret	14.14	Graded	81,652 62	1-17-23	Duplin Constr. Co.—Batson Cooke Co.
210	Craven	8.34	A. C.	292,698.06	4—3-22	West Construction Co.—A. P. Gilbert.
211	Craven	9.93	A. C.	288,946.02	1-30-22	Union Paving Co.
219	Duplin-Lenoir	15.60	Graded	148,339.29	6-1—21	Chitwood & Carpenter.
220	Wayne-Duplin	14.53	A. C.	394,301.05	2-27-23	Union Paving Co.
236 (F A 143)	Johnson	14.83	A. C.	475,321.55	10-2-22	R. G. Lassiter & Co.
245	Jones	15.67	P. C.	265,179.53	3-22-22	Hyde & Baxter.
254	Lenoir	.....	Bridge	73,415 32	11-22-22	Roanoke Iron & Bridge Co.
256	Lenoir	.....	Bridges	57,680.00	1-11-23	Englehardt-Kuehen.
263	Pamlico	12.03	A. C.	289,324.20	3-27-22	Union Paving Co.
264	Craven-Pamlico	.....	Bridge	27,156.25	7-24-22	Rhyne & Kitchen.
272	Sampson	16.47	Graded	98,807.39	6-19-22	R. E. Martin—Striblin—Stauddy & Newell.
273	Sampson	2.44	P. C.	96,916.82	2-27-23	Eagle Engineering Co.
275	Sampson	.....	Bridges	8,769.74	4—4-23	Rhyne & Kitchen.
282	Wayne	14.22	A. C.	398,168.00	11-11-22	Union Paving Co.
291	Wilson	7.63	A. C.	203,498.18	1-17-22	P. R. Ashby.
291B	Wilson	.....	Bridges	12,990.23	4—4-23	Jno. M. Ogden & Co., Road not let.
294	Wilson	.....	Bridge	15.770.80	11-29-22	Stearns Bros.
300	Bladen	11.99	S. C.	64,911.71	4—8-22	T. W. Chandler—Nello Teer.
301	Bladen	13.17	T. S.	82,028.21	11-21-21	J. F. Mulligan—Powell Paving & Const. Co.
312	Brunswick	9.77	P. C.	347,319.68	7—5-22	Alabama Conc. Prod. Co.—Batson-Cooke Co.
313	Brunswick	3.44	A. C.	105,706.65	3-15-22	Sou. Willite Paving Co.—Roanoke Bridge & Iron Works.
314	Brunswick	15.82	S. C.	109,259.10	2-23-22	Hagedorn Const. Co.
316	Brunswick	12.12	S. C.	80,068.72	8-14-22	B. Frank Price—Batson, Cooke Co.
317	Brunswick	.....	Bridge	19,783.20	11-30-22	Atlantic Bridge Co.
325	Columbus	11.22	T. S.	105,530.04	11—3-21	J. A. Kreis-Cornell-Young Co.
326	Columbus	13.61	S. C.	195,838.19	5-23-22	J. T. Plott—J. A. Kreis & Co.
327	Columbus	5.2	S. C.	38,269.44	6-21-22	J. A. Kreis.
328	Columbus	7.03	P. C.	219,371.68	12-26-22	L. L. Tindall
340	Cumberland	11.07	P. C.	381,032.02	6-15-22	Alabama Conc. Prod. Co.—Hobbs & Peabody.
342	Cumberland	5.91	A. C.	177,402.50	10-30-22	A. J. Wardrep.
351	New Hanover	10.64	A. C.	189,540.00	1—8-23	Southern Willite Paving Co.
363	Onslow	15.24	T. S.	208,476.95	3—5-23	Newell Constr. Co.—Pittsburg-Des Moines Steel Co.
364A	Onslow	9.95	S. C.	44,631.40	3-14-22	R. E. Martin.
364B	Onslow	12.84	T. S.	99,819.50	6-26-22	A. W. McClay.
376	Pender	7.64	Graded	94,757.85	11-11-21	C. G. Kershaw Const. Co.—Cornell Young Co.

STATUS OF STATE WORK IN NORTH CAROLINA---*Continued*

Projects Under Construction (Continued)

NO.	COUNTY	LENGTH	TYPE	ESTIMATED COST	BEGUN	CONTRACTOR
377	Pender-Duplin....	1.61	S. C.	$ 76,985.70	3-22-22	R. E. Martin-Hazell-Conerat-Quist Co.
378	Pender.....	14.12	W. B. Mac.	213,502.96	7-19-22	C. W. Lacy.
379	Pender.....	10.00	S. A.	100,000.00	5-22-22	State Forces.
380	Pender.....	8.98	W. B. Mac.	162,212.60	3—6-23	C. W. Lacy.
386-87	(F A-140) Robeson	19.8	P. C.	647,888.05	9-4-22	James O. Heyworth.
389	Robeson-Colum...	1.56	T. S.	83,463.38	10-26-21	L. A. Chitwood.
391A	Robeson.....	1.01	S. A.	43,332.08		R. G. Lassiter
391B	Robeson.....	1.10	T. S.	17,433.00	2-26-23	H. M. Beasley.
400	Chatham.....	.....	Bridge	57,420.22	4-14-22	R. M. Walker & Co.
402	Chatham.....	6.92	T. S.	33,940.28	8—1-22	W. N. Thompson.
403	Chatham.....	7.01	T. S.	66,814.00	2-27-23	C. G. Kershaw.
411	Durham.....	5.81	P. C.	211,574.92	9-15-21	Hutton Eng. & Const. Co.
412	Durham.....	8.80	P. C.	252,582.00	11-15-22	L. L. Tindall.
419	Franklin.....	12.82	T. S.	63,021.97	7-27-22	Jamison Bros.—J. M. Gregory.
420	Franklin.....	1.56	R. C.	55,421.30	7-11-22	Chandler & Ragland.
428	Granville.....	4.19	R. C.	142,637.77	7-14-22	Pittman Const. Co.
429	Granville.....	6.94	P. C.	261,393.00	3-21-23	R. B. Sandidge.
456	Orange.....	9.81	Graded	37,459.07	1—7-22	Crawford & Crawford—Nello Teer.
457A	Orange.....	7.45	Graded	75,398.67	4-12-23	Dicus Bros.—Richards Bros.
460	Orange.....	9.87	A. C.	296,835.55	9-25-22	R. M. Hudson & Co.
463	Person.....	11.24	P. C.	327,171.35	8-14-22	Porter & Boyd.
473 (F A 146)	Vance.....	7.83	P. C.	265,546.60	7-11-22	R. G. Lassiter & Co.
481	Wake.....	7.40	A. C.	254,995.34	1-24-22	Union Paving Co.—P. R. Ashby.
484	Wake.....	8.79	P. C.	311,590.40	8-23-22	P. R. Ashby-Booz-Lloyd & Co.
486	Wake.....	9.04	T. S.	41,074.00	4-11-23	O. A. Mann & Co.
492	Warren.....	4.48	Bit Mac	100,436.13	4-10-22	Porter & Peck—A. C. House.
493	Warren.....	3.39	Bit Mac	77,866.80	7-27-22	Porter & Peck.
494 (F A 147)	Warren.....	6.21	A. C.	208,130.01	9—6-22	Clifford Engineering Co.
502	Alamance.....	17.43	T.S.&B.M.	138,629.97	7-17-22	W. E. Graham—Hanford Bros.
503	Alamance.....	.....	Bridge	59,450.38	7-17-22	Atlantic Bridge Co.
504	Alamance.....	5.22	A. C.	154,127.16	3-17-22	Elliott & Sholes.
512	Caswell.....	11.67	T. S.	54,375.53	2-19-23	J. T. Plott.
525	Davidson.....	10.24	A. C.	363,850.08	12-23-21	Elliott & Sons & Boggs—Austin Bros. Bridge Co.
528	Davidson.....	10.24	P. C.	427,511.92	10-2-22	Hagedorn Constr. Co.—J. A. Peterson.
532	Guilford.....	11.70	A. C.	385,957.88	2—1-22	Elliott-Sholes Co.
532B	Guilford.....	.....	Bridges	24,730.00	1—5-23	L. M. Lowdermilk.
533	Guilford-Forsyth..	10.59	P. C.	427,997.62	7-11-21	Royer-Ferguson Const. Co.
535	Guilford.....	7.78	R. C.	277,955.21	4-19-22	Leaksville Lumber Co.
544	Hoke.....	10.45	S. C.	32,445.49	5-16-22	O. A. Mann & Co.—Chitwood & Carpenter.
545	Hoke.....	9.15	T. S.	58,195.06	6—5-22	O. A. Mann & Co.—A. W. McClay.
546	Hoke.....	0.84	S. A.	27,949.00	11-27-22	Dawkins Constr. Co.
555	Montgomery.....	20.55	T. S.	103,708.00	2-19-23	Mayfield Construction Co.—F. P. Holder.
566	Moore.....	7.14	T. S.	62,079.21	3—6-22	Gibson Const. Co.—Nello Teer.
569	Moore.....	18.97	S. C.	97,151.45	8—1-22	Mayfield Const. Co.
577	Randolph.....	13.77	P. C.	422,343.57	4-18-22	Royer-Ferguson Co., Inc.—J. L. Brinkley.
588	Rockingham.....	7.98	R. C.	266,498.43	4-11-22	Cheatwood & Driscoll.
589	Rockingham.....	9.81	P. C.	324,975.31	10-30-22	Cheatwood & Driscoll—Atlantic Bridge Co.
590	Rockingham.....	2.10	P. C.	66,092.18	12-5-21	Geo. R. Martin
593 (F A 38)	Rockingham-Caswell.....	17.98	P. C.	525,393.22	7-11-22	J. A. Kreis.
600	Alexander.....	9.3	Graded	12,530.98	5-26-22	Bolton Construction Co.
602	Alexander.....	9.28	Bit Mac	189,329.80	10—9-22	W. E. Graham.
606	Stanley-Anson....	.....	Bridge	54,759.32	3-23-22	Concrete Steel Bridge Co.
607	Anson.....	6.39	T. S.	37,098.91	3-21-22	Geer & Wilson—Booz-Lloyd & Co.
608	Anson.....	7.88	A. C.	345,408.58	9-27-22	Lampton & Burks—J. A. Peterson.
614 (F A 144)	Cabarrus.....	9.20	P. C.	350,085.07	7-21-22	A. L. Harris—Oliver & Costello Bros.
615	Cabarrus.....	3.88	A. C.	98,741.17	3—9-23	Thompson-Caldwell—Atlantic Bridge Co.
616	Cabarrus.....	8.59	Gravel	46,024.00	4-12-23	Lee J. Smith—L. M. Lefler.
622	Catawba.....	10.85	A. C.	354,321.44	1-23-22	Union Paving Co.
629	Catawba.....	7.52	P. C.	268,662.48	6—5-22	A. L. Harris—R. M. Thurmond & Co.
630B	Gaston.....	6.65	A. C.	218,625.00	8—8-22	W. F. McCanless, Hobbs-Peabody Constr. Co.
632	Gaston.....	8.50	R. C.	291,868.94	1—2-22	Davis-Wilcox Const. Co.
633B	Gaston.....	3.8	A. C.	57,247.41	1—6-23	Gaston County.
639	Iredell.....	10.59	A. C.	387,346.19	1—2-22	R. M. Hudson Co.—Luten Bridge Co.
640	Iredell.....	8.17	Bit Mac	181,990.82	9-26-22	W. E. Graham.
647	Lincoln.....	7.10	P. C.	250,108.15	6—5-22	A. L. Harris—R. M. Thurmond & Co.
653	Mecklenburg.....	8.84	A. C.	308,732.43	2-28-22	Union Paving Co.—Luten Bridge Co.
654	Mecklenburg.....	10.1	A. C.	302,887.09	4—3-22	Lampton & Burks.
658 (F A 145)	Mecklenburg.....	9.55	A. C.	266,758.80	10—9-22	Union Paving Co.
659	Mecklenburg.....	7.93	Graded	36,650.00	4—9-23	County Commissioners—Luten Bridge Co.
661	Richmond.....	9.76	T. S.	40,683.41	7-18-22	McDonald & Brooks.
665	Richmond.....	5.77	A. C.	194,501.23	7-28-22	A. J. Wardrep.
670	Cabarrus-Rowan..	4.53	P. C.	142,221.53	6-29-22	Harris Construction Company.
671	Rowan.....	7.34	A. C.	309,262.14	3-20-23	Thompson-Caldwell Construction Co.,—Atlantic Bridge Co.
673	Davidson-Rowan..	.59	Bridge	221,353.00	9-19-22	Hardaway Contracting Co.—Elliott & Sons.

STATUS OF STATE WORK IN NORTH CAROLINA---*Continued*

Projects Under Construction (Continued)

NO.	COUNTY	LENGTH	TYPE	ESTIMATED COST	BEGUN	CONTRACTOR
677	Scotland-Robeson	7.11	R. & P. C	$ 283,460.61	4-26-22	P.R. Ashby—J. B. Murphy.
691	Union	.....	Bridge	14,520.00	2-13-23	J. S. Brinkley.
694	Union	.....	Bridge	23,549.13	11-14-22	Hagedorn Construction Co.
696	Union	6.05	A. C.	139,901.30	1-30-23	Redmon Construction Co.
700	Alleghany	7.80	W. B. Mac	132,297.33	6-23-21	W. E. Graham.
701	Alleghany-Wilkes	8.00	W. B. Mac	166,245.20	6-16-21	W. E. Graham.
702A	Alleghany	7.75	Bit Mac & Gravel	209,188.98	10-31-22	O'Brien Constr. Co.—Luten Bridge Co.
711	Ashe	6.50	Gravel	60,000.00	9—7-22	Little Contracting Co.
712	Ashe	11.06	Gravel	197,687.38	10-24-22	J. T. Plott.
713b (FA 139)	Ashe	.....	Bridges	272,283.22	8-22-22	Concrete Steel Bridge Co.—R'dway not let.
724	Caldwell	4.66	T. S.	51,890.66	5—8-22	County Road Commrs—R. M. Thurmond & Co.
726 / 726A	Caldwell	11.00	Gravel	50,000.00		State Forces. / J. F. Mulligan Construction Co.
731	Davie	5.46	P. C.	195,393.11	3-13-22	G. R. Martin-Heilig & Sherrill.
741	Forsyth	8.90	P & R. C.	315,025.81	7-27-22	Hardaway Construction Company.
742 (FA 137)	Forsyth	10.62	R. C.	413,067.27	6-20-22	Harris Construction Co.
743	Forsyth	11.35	A. C.	414,085.43	4—2-23	Atlantic Bitulithic Co.
744	Forsyth	2.00	T. S.	*	1-11-22	Forsyth County.
750	Stokes	14.86	T. S.	93,054.48	9-15-21	J. F. Mulligan Const. Co.—Lee J. Smith.
752	Stokes	9.67	T. S.	124,874.75	2-17-23	W. E. Graham.
761	Surry	2.22	P. C.	77,334.01	11-22-22	Geo. R. Martin.
765	Surry	3.40	P. C.	112,685.76	10-24-22	Campbell Constr. Co.
770A	Watauga	3.00	Bit-Mac.	40,000.00	8-12-22	State Forces.
770B	Watauga	8.90	Gravel	93,500.00	4-16-23	State Forces.
771A	Watauga	2.50	Bit. Mac	30,000.00	9—7-22	State Forces.
771B	Watauga	13.50	Gravel	35.000.00	9—7-22	State Forces.
780	Wilkes	7.83	Recon	25,000.00	7-25-21	J. F. Mulligan.—State Forces.
781	Wilkes	14.50	Recon	154,000.00	7-25-21	J. F. Mulligan.—State Forces.
782	Wilkes	5.97	R. C.	184,614.65	3-29-22	Hyde & Baxter.
783	Wilkes-Watauga	36.00	Gravel	174,900.00	9—2-21	Chandler & Ragland
784	Wilkes	4.97	T. S.	85,966.21	8-30-22	J. F. Mulligan Constr. Co.—Foster Constr. Co
785	Wilkes	2.52	P. C.	78,703.50	4—2-23	J. D. Brookshire & Co
790	Yadkin	10.12	P. C.	330,254.27	4-24-22	Pittman Construction Co.
800	Avery	5.84	Grav & R C	198,827.02	7-24-22	O'Brien Const. Co.—J. A. Kreis.
811	Burke	5.24	P. C.	185,132.97	1-13-22	Southern Dray Co.
815	Burke-Clev'nd.-Lincoln	11.63	T. S.	153,126.60	4-28-22	Geer & Wilson—J. L. Van Glahn.
821	Cleveland	1.58	P. C.	60,192.33	10-31-22	Davis-Wilcox Constr. Co.
822 (FA 150)	Cleveland	10.47	A. C.	404,444.48	9-27-22	Elliott & Sons—J. A. Kreis & Co.
833	Henderson	5.20	Gravel	34,952.94	1—3-22	S. L. Davis Const. Co.—Asheville Const. Co.
846	McDowell	10.06	Gravel	204,680.74	9-22-21	Asheville Const. Co.—W. T. Taylor Const. Co.
847	McDowell	3.84	Graded	91,217.50	10-19-22	C. W. Lacy—Oliver & Costello Bros.
848	McDowell	.....	Bridge	18,597.04	11-21-22	R. M. Thurmond & Co.
856	Mitchell	6.88	Bit Mac	239,343.83	3-20-22	Porter & Boyd—L. J. Chandler & Co.
858	Mitchell	.....	Bridge	42,367.49	10-2-22	R. M. Thurmond & Co.
860	Mitchell	5.65	W. B. Mac	152,908.42	4-21-22	J. F. Mulligan—W. H. Anderson Const. Co.
876 (FA 78B)	Rutherford	4.80	P. C.	146,264.80	10-30-22	Fiske-Carter Construction Co.
882	Rutherford	15.80	T. S.	94,676.78	9-20-22	C. R. Willard & Sons.
888	Yancey	15.22	W. B. Mac	230,499.94	10-10-22	The Luck Co.
901 (FA 148)	Buncombe	7.52	P. C.	354,082.45	11—6-22	R. C. Stephens—A. J. Wardrep
903	Buncombe	2.58	A. C.	100,399.47	4-10-22	Asheville Paving Co.—R. C. Stevens.
904	Buncombe	1.60	A. C.	80,969.13	3-13-22	Asheville Paving Co.—R. C. Stevens.
911	Cherokee	10.33	Gravel	144,991.44	10-25-21	H. A. Wells—Southern Dray Co.
913	Cherokee	10.33	W. B. Mac	95,554.80	8—8-22	Mills, Williams Construction Company.
920	Clay	5.01	Gravel	50,716.66	1—9-22	E. A. Wilson & Co.—W. T. Moore Conc. Prod. Co.
921	Clay	12.37	Gravel	99,988.02	10-24-21	Lee J. Smith Const. Co.—W. T. Moore Conc. Prod. Co.
930	Graham	12.90	Gravel	143,574.20	10-15-21	Lee J. Smith Const. Co.—C. M. Dicus.
940	Haywood	7.13	W. B. Mac	126,069.30	4-14-22	Alexander & Patton—H. A. Brown & Co.
950	Jackson	7.56	Gravel	145,313.30	6-13-21	Wright & Nave—O'Brien Const. Co.
951	Jackson	11.85	W. B. Mac	249,546.00	8-17-22	R. H. Wright & Sons—W. T. Moore Conc Prod. Co.
952A	Jackson	10.35	Graded	164,126.60	8-17-22	Brooks-Calloway Company.
953	Jackson	12.72	Graded	118,186.75	7—1-22	C. C. McCabe.
954	Jackson	1.68	P. C.	90,871.77	7—1-22	Mills, Williams Construction Company.
960	Macon	4.97	S. C.	69,100.57	6—6-21	J. T. Plott—J. E. Lane & Co.
961	Macon	4.77	T. S.	58,340.59	12—5-21	J. T. Plott—J. E. Lane & Co.
962	Macon	13.58	W. B. Mac	171,200.05	4-24-22	O'Brien Const. Co.—Griffin Const. Co.
963	Macon	8.68	Graded	124,354.01	11-10-22	Costello Bros.—Brooks-Calloway Co.
970	Madison-Yancey	13.80	W. B. Mac	218,940.17	11-11-21	R. H. Wright & Sons—O'Brien Const. Co.
971	Madison	6.74	Gravel	114,026.00	4-23-23	Reynolds Const. Co.-MooreConcreteProd. Co.
972	Madison	7.00	Graded	9,000.00	4—6-23	State Forces.
980	Macon-Swain	17.84	W. B. Mac	350,175.11	3-20-22	Costello Bros.—Condon & Condon.
990	Transylvania	8.87	W. B. Mac	151,238.89	6—5-22	Sam L. Davis Const. Co.—R. C. Stevens.
991	Transylvania	7.03	Graded	156,653.20	3—6-23	Gibson Construction Co.

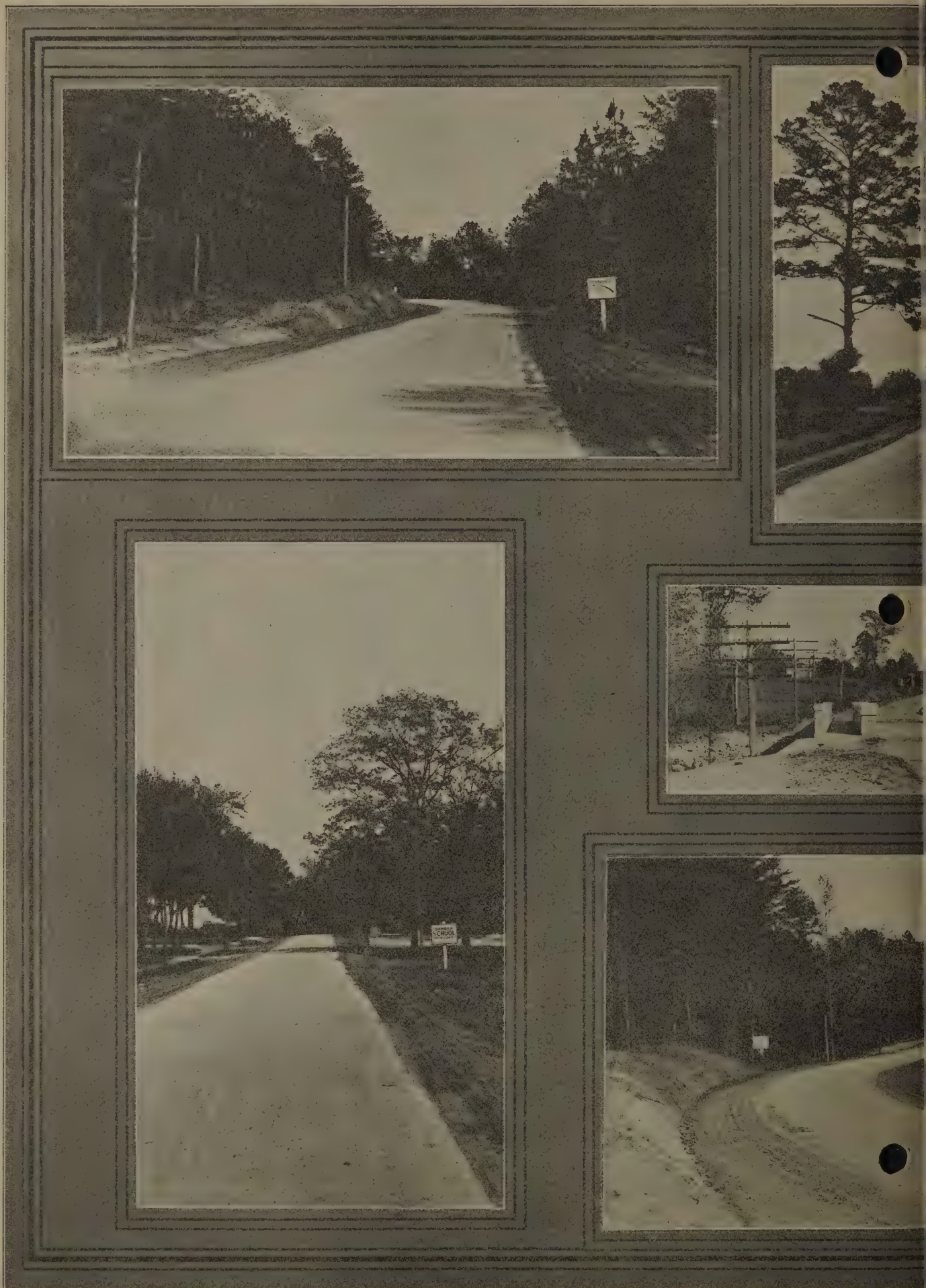
*Built by county.

STATUS OF STATE WORK IN NORTH CAROLINA---*Continued*

Projects Completed

NO.	COUNTY	LENGTH	TYPE	APPROXIMATE COST	COMPLETED	CONTRACTOR
100	Beaufort	10.50	R. C.	$ 369,777.70	.....	W. T. Hadlow
103	Beaufort	.03	R. C.	1,706.75	7—3-22	R. G. Lassiter.
114	Chowan	10.40	Graded	45,064.09	4-14-23	Battershill & Goode—Chandler & Ragland.
125	Edgecombe	15.11	A. C.	426,438.76	4-23-23	R. G. Lassiter.
139	Halifax	.....	Bridge	*20,425.59	8-25-22	Chandler & Ragland—Porter & Peck.
140	Halifax	.....	Bridge	*11,043.05	5—5-22	Von Glahn & Talbott.
160	Frklin.-Wake-Nash	8.93	T. S.	53,722.95	3—7-23	Chandler & Ragland—Southern Dray Co.
166	Northampton	.47	Bridge	17,954.75	9-14-22	W. D. Murrey—Sadler Corp.
186	Pitt	9.57	R. C.	*248,103.78	8—5-22	Cheatwood & Driscoll.
209	Craven	2.65	P. & R. C.	*114,569.02	2-15-22	Eagle Engineering Co.
218	Wayne-Duplin	16.06	Graded	92,589.58	2-24-23	C. W. Lacy.
227	Greene	6.81	A. C.	239,797.80	1-25-23	West Construction Co.—Union Paving Co.
255	Lenoir	0.82	S. A.	30,384.89	8-18-22	West Construction Co.
280	Wayne	10.01	A. C.	311,352.36	4-12-23	Union Paving Co.
281	Wayne	.....	Bridge	*21,225.49	1-15-23	P. R. Ashby.
338	Cumb.-Samson	.....	Bridge	26,323.99	9-26-22	Roanoke Bridge & Iron Works.
339	Harnett-Cumb	.754	T. S.	19.067.28	8-31-22	Porter & Boyd
341	Cumb.-Hoke	.2	Graded	*1,042.55	2-28-22	W. B. Covington
375	Pender	13.56	S. C.	68,830.09	11-21-22	A. W. McClay
388	Robeson	3.35	R. C.	137,009.40	9-28-22	C. W. Lacy—Roanoke Bridge & Iron Co.
409	Durham	0.5	Graded	*5,409.10	8—7-22	J. P. Dicus.
410	Durham	2.3	R. C.	*81,105.75	9-28-22	C. D. Riggsbee.
427	Granville	5.12	A. C.	178,257.64	1—4-23	R. G. Lassiter & Co.
436	Harnett	21.91	Gravel	202,563.88	1-15-23	C. G. Kershaw Const. Co.—Hobbs & Kitchen.
445	Lee	5.91	T. S.	18,692.85	1-15-23	C. B. Hester.
446	Lee	5.90	A. C.	197,188.22	1-15-23	Atlantic Bitulithic Co.—O. A. Mann & Co.
453	Orange	.....	Bridge	33,706.80	1—9-23	Geo. W. Kane.
454	Orange	4.28	P. C.	197,675.32	3-6-22	Elliott, Sholes & Teer.
455	Orange	4.19	T. S.	*55,214.44	9-28-22	J. F. Mulligan Const. Co.—P. R. Ashby.
482	Wake	6.64	A. C.	*184,393.31	9-23-22	R. M. Hudson Company.
483	Wake	0.54	R. C.	*15,630.74	8-7-22	C. D. Riggsbee.
500	Alamance	5.22	Graded	*36,844.34	1-17-22	W. W. Tuck & Son—A. M. Hazell, Connerate—Quist Construction Co.
501	Alamance	13.1	T. S.	30,927.27	2-28-23	W. M. Shook-Hanford Bros.
505	Alamance	0.42	S. A.	*15,229.74	6-23-22	Hedrick Construction Co.
511	Caswell	14.80	T. S.	73,242.18	10-11-22	White & Simpson-C. B. Hester
524	Davidson	0.3	S. A.	*9,941.54	1-20-22	Town of Lexington.
525A	Davidson	.5	S. A.	*16,419.86	6-27-21	Town of Lexington.
526	Davidson	3.77	P. C.	*131,269.66	10-25-22	Hagedorn Constr. Co.—Heilig & Sherrill.
538	Guilford	.....	Bridge	7,039.01	2-21-23	J. L. Brinkley.
539	Guilford	0.64	S. A.	21,639.20	1-19-23	Robt. G. Lassiter & Co.
540	Guilford	18.00	Recon.	16,527.54	1-23-22	J. T. Plott.
567	Moore	2.96	T. S.	*9,967.53	9-18-22	C. E. Teague.
601	Alexander	3.07	T. S.	33,630.45	.....	Guss Ginn-R. M. Thurmond
630A	Gaston	3.02	A. C.	*98,854.41	7- -22	W. F. McCanless.
633A	Gaston	13.77	A.C. & Rec.	180,000.00	10-5-22	Gaston County
634	Gaston	Bridge	Recon.	4,500.00	.....	State Forces.
638	Iredell	7.88	A. C.	262,142.65	1-20-23	Thompson-Caldwell Co.
652	Mecklenburg	.....	Bridge	1,923.28	10-30-22	State Forces.
655	Mecklenburg	1.57	P. C.	63,695.17	7-31-22	Speed-Parker Co., Inc.—Luten Bridge Co.
656	Mecklenburg	10.4	Bit.-Mac.	200,000.00	10-30-22	State Forces.
657	Mecklenburg	13.80	Recon.	20,000.00	10-30-22	State Forces.
692	Union	2.28	A. C.	*65,279.20	12-28-21	Redmon Construction Co.
693	Union	1.14	Gravel	3,324.48	.....	Sykes-Collins Co.
695	Union	4.51	A. C.	*138,738.07	9-14-22	Redmon Construction Co.
710	Ashe	3.14	P. C.	*142,707.93	8-17-22	Pittman Construction Co.
719	Caldwell	.....	Bridge	*7,906.87	6-26-22	Cottrell & Howard.
719B	Caldwell	.99	Gravel	1,665.33	11-15-22	J. G. Bumgardner
722	Caldwell	7.40	Recon	*20,923.25	1-18-22	County Forces.
725	Caldwell	4.00	Recon	28,015.46	2-24-23	County Commissioners.
751	Stokes	7.16	T. S.	*35,124.08	10-4-21	W. E. Graham.
760	Surry-Alleghany	6.9	T. S.	*32,084.18	11-5-22	W. E. Graham.
764	Surry	1.63	R. C.	50,588.20	2—4-23	Leaksville Lumber Co.
801	Avery	.99	W. B. Mac	22,350.24	10-26-22	Geer & Wilson.
814	Burke	8.69	S. C.	13,459.60	4-25-23	M. A .Kollock.
823	Cleveland	1.90	P. C.	*80,421.65	8-15-22	Southern Paving Co.—Z. B. Weathers & Son.
844	McDowell	1.8	P. C.	*61,233.34	12-13-21	Bolton Construction Co.
845	McDowell	7.19	Gravel	132,177.93	12-22-22	J. W. Stapp Constr. Co.-Praytor, Howton&Wood.
855	Mitchell	4.97	P. C.	174,393.78	4-17-23	Fisk-Carter Construction Co.
855B	Mitchell	.....	Bridge	*22,699.85	8-22-22	Luten Bridge Co.
866	Polk	5.96	Bit Mac	180,393.40	11-21-22	Southern Paving Co.—Henry Constr. Co.
875	Rutherford	.....	Bridge	*6,151.61	7-18-22	Geer & Wilson
877	Rutherford	9.79	T. S.	64,563.73	8—7-22	Geer & Wilson.
878	Rutherford	6.55	T. S.	44,984.50	10-27-22	Michaux Const. Co.—Geer & Wilson.
879	Rutherford	.....	Bridge	*6,781.99	6-21-22	Austin Bros. Bridge Co.
880	Rutherford	.....	Bridge	24,679.43	3-23-23	Austin Bros. Bridge Co.
910	Cherokee	7.56	Gravel	76,743.59	2-24-23	Ross Bros. Constr. Co.—W. T. Moore Concrete Prod. Co.
942	Haywood	0.57	Gravel	*6,490.43	2—1-22	O'Brien Construction Co.

(*Final Cost)



STATUS OF STATE WORK IN NORTH CAROLINA---*Continued*

PROJECTS UNDER CONTRACT

NO.	COUNTY	LENGTH	TYPE	APPROXIMATE COST	CONTRACTOR
107	Bertie	19.30	Graded	$ 50,127.00	Nello Teer—Atlantic Bridge Co.
115 (FA 163) (149)	Chowan-Perquim.	11.83	P. C.	326,304.00	Smith Bros., Inc.
329 (FA 392) (155)	Nash	14.96	P. C.	409,592.40	Public Service Production Co.
400A	Columbus	12.88	A. C.	422,462.60	Jas. L. Heyworth.
437	Robeson	1.06	T. S.	24,937.00	Robeson County Commissioners—E. T. Gwathmey.
485A	Chatham	.....	Grading	5,400.00	C. B. Hester (Fill).
485C	Harnett	10.74	Gravel	101,031.26	F. P. Holder—T. J. Newell
570	Wake	7.35	Graded	92,818.00	C. G. Kershaw Construction Co.—T. J. Newell.
578 (FA 643) (156) (157)	Wake	.51	Grading	10,452.00	Nello Teer (Fill).
713 (FA 835) (139)	Moore	22.70	T. S.	90,804.33	A. B. McDonald.
882B	Randolph	7.91	P. C.	308,537.68	Allport Construction Corp.
944	Iredell	8.57	A. C.	321,614.81	Stearns Bros.
	Ashe	3.53	P. C.	126,872.75	Overstreet & Nance.
	Henderson	6.97	W. B. Mac.	281,162.75	J. B. Ross, Jr.—R. C. Stevens.
	Rutherford	.....	Bridge	10,576.50	Micheaux Contracting Co.
	Haywood	10.18	A. C.	409,683.45	A. J. Wardrep.

STATUS OF FEDERAL AID WORK IN NORTH CAROLINA

Projects Under Construction

NO.	COUNTY	LENGTH	TYPE	APPROXIMATE COST	BEGUN	CONTRACTOR
15	Guilford	4.205	Bit. Mac.	$ 5,441.75	9–1–17	County Commissioners.
61	New Hanover	2.186	P. C.	234,841.39	7–12–20	C. W. Lacy.
69	Transylvania	9.348	W. B. Mac.	231,409.04	3–25–20	Allport & Alexander Construction Co.
94A	Mitchell	5.04	W. B. Mac.	190,375.13	6–22–20	Gibson Construction Co.
125A	Alleghany	4.99	Bit. Mac.	153,899.13	11–22–21	W. E. Graham.

Summary

WORK UNDER CONTRACT

Type	STATE		FEDERAL AID	
	Length	Cost	Length	Cost
P. C.	38.23	$ 1,171,306.83	.....	.....
A. C.	31.63	1,153,760.86	.....	.....
W. B. Mac.	6.97	281,162.75	.....	.....
T. S.	23.76	115,741.33	.....	.....
Gravel	10.47	101,031.26	.....	.....
Graded	26.65	158,797.00	.....	.....
Bridges	.....	10,576.50	.....	.....
Total	137.71	$ 2,992,376.53	.....	.....

WORK UNDER CONSTRUCTION

P. C.	307.20	$ 10,018,538.08	2.19	$ 234,841.39
R. C.	63.64	2,289,835.36	.....	.....
A. C.	280.71	8,856,581.81	.....	.....
S. A.	21.74	273,281.08	.....	.....
Bit. Mac.	51.02	1,215,997.48	9.19	159,340.88
W. B. Mac.	143.27	2,465,390.77	14.39	421,784.17
Brick	9.50	217,405.72	.....	.....
T. S.	356.35	2,744,111.56	.....	.....
S. C.	165.19	1,223,871.84	.....	.....
Gravel	185.28	1,930,227.47	.....	.....
Graded	214.75	1,650,833.26	.....	.....
Recon.	22.33	179,000.00	.....	.....
Cord	2.40	55,818.01	.....	.....
Bridges	.....	1,384,127.38	.....	.....
Total	1,823.38	$ 34,505,019.82	25.77	$ 815,966.44

Summary---Continued

WORK COMPLETED

Type	STATE		FEDERAL AID	
	Length	Cost	Length	Cost
P. C.	24.08	$ 965,965.87	26.56	$ 889,940.67
R. C.	27.92	903,922.32	.....	.....
A. C.	81.05	2,282,442.42	42.29	1,521,368.25
S. A.	2.68	93,669.23	22.91	763,048.82
Bit. Mac.	16.36	380,393.40	30.62	798,895.02
W. B. Mac.	.99	22,530.24	14.00	303,505.78
T. S.	93.70	484,681.04	509.18	5,228,132.54
S. C.	24.25	82,289.60	83.90	785,198.22
Gravel	38.37	421,300.31	42.56	488,699.18
Graded	32.87	170,424.91	29.23	252,426.17
Recon.	42.80	89,966.25	.....	.....
Bridges	.....	207,861.71	.....	651,051.10
Total	385.07	$ 6,105,447.30	801.25	$ 11,682,265.75

Total Roadway Mileage 3,173.18. Total estimated cost of Roadway $53,847,459.15. Total estimated cost of Bridges $2,253,616.69

Corrected to May 1, 1923.

LEGEND

P. C.—*Plain Concrete. R. C.—*Reinforced Concrete. A. C.—*Asphaltic Concrete. S. A.—*Sheet Asphalt. Bit. Mac.—*Bituminous Macadam. W. B. Mac.—*Water Bound Macadam. T. S.—†Top Soil. S. C.—†Sand Clay. Gravel—†Gravel. Graded—†Graded. Recon.—†Reconstruction. Cord.—†Corduroy.

* Hard Surface. † "G" Type.

Review *of* Four Years *of* Highway Construction *in* State

(Continued From Page 3)

Approximately $41,000,000 of the $65,000,000 provided for road construction by the Legislature of 1921 and 1923 has been expended for construction, either in work under contract, under construction, or completed. Certain of the projects let during the present administration have been allotted Federal Aid funds totalling, $2,690,709. The remainder of the total sum shown in the preceding paragraph is made up of work which was let prior to 1921, the cost of which was borne as stated before by the Federal Government, the State, and the various counties; the funds supplied by the State being derived from the automobile license tax.

During the next two years the remaining $24,000,000 will be expended on other roads on the State system on which no work has been let. From Federal Aid allotments for the years 1922 and 1923 there remains an unallotted balance of $158,180.90, while there will be $1,477,424.33 available on June 30th, making a total of funds to be expended of $25,635,605.23. As stated before, the rate at which new work will be let will be governed largely by the condition of the labor and material market.

Conference *of* Highway Officials

(Continued From Page 9)

Realizing the grave responsibility resting upon the officials charged with the administration of the highways for the safety of the public, we earnestly appeal to the people at large to aid in making these conclusions effective.

Thos. H. MacDonald, Chief, Bureau of Public Roads, U. S. Department of Agriculture.

Frederick Stuart Greene, New York State Highway Commissioner.

Arthur W. Dean, Chief Engineer, Massachusetts State Highway Commission.

Frank Page, Chairman, North Carolina State Highway Commission.

Paul D. Sargent, Chief Engineer, Maine State Highway Commission.

Clifford Older, Chief Engineer, Illinois State Highway Commission.

H. G. Shirley, Chairman, Virginia State Highway Commission.

Charles J. Bennett, Connecticut State Highway Commissioner.

Wm. H. Connell, Pennsylvania State Asst. State Highway Commissioner.

Report of Inspection of

A PERMANENT CULVERT

Installed ten years ago.

Sulphur	.027%
Silicon	.006%
Phosphorus	.006%
Carbon	.010%
Manganese	.021%
Copper	.038%
Total Impurities	.108%
PURE IRON	99.89

Time has tested this Armco Culvert and established its permanence.

Mr. J. G. Baldwin,
Asheville,
North Carolina.

Mooresboro, N. C.
September 8, 1922.

Dear Sir:-

The culverts shown in the accompanying pictures have, to my personal knowledge, been installed respectively eight and ten years.

The galvanizing on the ten-year-old piece is grey, and almost as good as the day it was installed. The other pipe, having been poorly installed (half exposed for six years), has had the galvanizing knocked and worn off the top, but is in first-class condition as far as rusting is concerned.

(Signed) D. C. Wright, No. 7 Township Commissioner,
Cleveland County, N. C.

ARMCO Resists Rust Ingot Iron

THE DIXIE CULVERT & METAL COMPANY

ATLANTA, GEORGIA

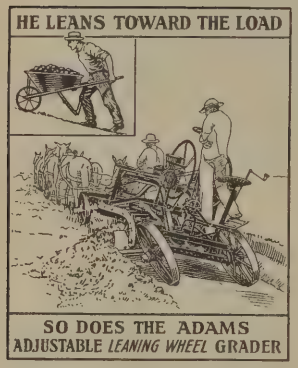
J. G. BALDWIN,
ASHEVILLE, N. C.

W. H. MCNEILL,
LAKEVIEW, N. C.

ARMCO Resists Rust Ingot Iron

ONE OF THE NORTH CAROLINA STATE HIGHWAY DEPARTMENT'S NO. 12 ROAD KING CUTTING DOWN A ROUGH DITCH BANK

in North Carolina



ADAMS Graders have proved their superiority and their ability to build the most miles of Good Roads per dollar or per day. There's only one reason—the Adjustable Leaning wheels are an exclusive feature on Adams Graders by means of which the weight of Adams Graders is leaned toward and balanced against the load. This overcomes side-draft and skidding, increases capacity and lessens the draft. This feature also enables Adams Graders to do difficult ditch and bank work, not successfully accomplished with other graders.

Every Adams Grader is guaranteed to prove these claims. Write today for catalog and let us show you how Adams Graders will reduce your grading costs.

ADAMS GRADERS are built in 6½ ft. to 12 ft. blade lengths. There is a size to suit your needs and power exactly.

Write Our Local Distributor

J. C. BENJAMIN

733 WEST HARGETT STREET RALEIGH, NORTH CAROLINA

J. D. ADAMS & COMPANY

HOME OFFICE AND FACTORY: INDIANAPOLIS, INDIANA

ADAMS ADJUSTABLE LEANING WHEEL GRADERS

IN twenty years Portland cement has advanced from comparative insignificance to the leading position in the construction material field. The ready adaptability of Portland cement to every kind of construction, from fence posts on the farm to gigantic dams and highways of endurance; the facility with which it can be handled; its durability which gives the highest degree of permanence, backed up by constant attention to perfection in manufacture and the most intelligent and comprehensive educative and advertising work that has ever been given to any building material, all combine to account for the remarkable progress achieved by the Portland cement industry. We take just pride in having always kept faith with the sound principles followed by this great industry.

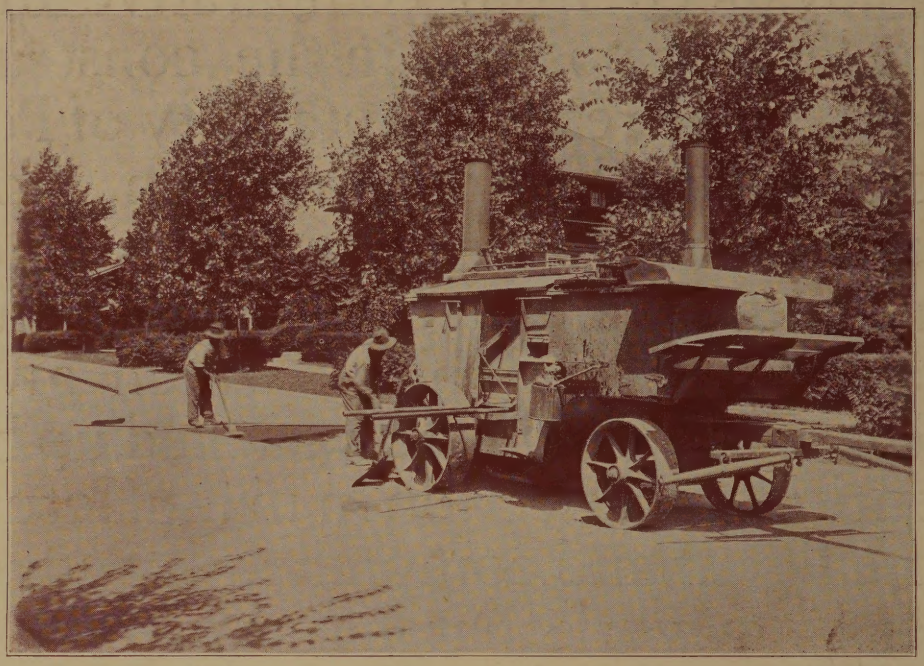
Every requirement for the manufacture of the high standard of quality laid down by the established scientific standard specifications is rigidly followed in making Clinchfield Portland cement. Service in the fullest meaning of the word is our watchword in dealing with our customers.

Builded upon this firm foundation of quality and service the Clinchfield plant has steadily grown and expanded and its products have been used with constant satisfaction for all classes of construction work in the South.

CLINCHFIELD PORTLAND CEMENT CORPORATION

Office and Mills: Kingsport, Tennessee

ATTENTION



Mr. City and County Commissioner:

How about the Maintenance of your Asphalt Streets and Roads?

Investigate *now* the ANDRESEN ROAD REPAIR OUTFIT, so you will have the facts before you when your asphalt pavements begin to show the effects of heavy traffic.

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